NOV 21 1911

MYCOLOGIA

IN CONTINUATION OF THE JOURNAL OF MYCOLOGY

Founded by W. A. Kellerman, J. B. Ellis, and B. M. Everhart in 1885

EDITOR

WILLIAM ALPHONSO MURRILL

Vol. III—NOVEMBER, 1911—No. 6.

ASSOCIATE EDITORS

JOSEPH C. ARTHUR
HOWARD J. BANKER
GIACOMO BRESADOLA
FREDERIC E. CLEMENTS
JOHN DEARNESS
FRANKLIN S. EARLE
BRUCE FINK
THOMAS H. MACBRIDE
PAUL MAGNUS
GEORGE MASSEE
NARCISSE PATOUILLARD
LARS ROMELL
FRED J. SEAVER
CORNELIUS L. SHEAR

PUBLISHED BIMONTHLY FOR
THE NEW YORK BOTANICAL GARDEN
By THE NEW ERA PRINTING COMPANY
LANCASTER, PA.

CONTENTS

	PAGE
The Agaricaceae of Tropical North America—IV. WILLIAM A. MURRILL	271
Schizosaccharomyces octosporus W. C. COKER AND LOUISE WILSON	283
The Rusts of Guatemala—II. - - FRANK D. KERN	288
News and Notes - - - - - - - - -	291
Index to Volume III. - - - - - - - -	295

The New Era Printing Company makes the following charges to authors for articles reprinted from MYCOLOGIA, if ordered with proof:

Without Cover—	4 pp.	8 pp.	12 pp.	16 pp.	20 pp.	24 pp.	28 pp.	32 pp.
25–50 Copies—	$1.37	$1.87	$2.12	$2.50	$3.50	$4.05	$4.82	$5.20
100 "	1.55	2.15	2.65	3.15	4.05	5.00	6.10	6.50
200 "	2.00	3.05	4.00	4.30	5.60	6.90	8.30	8.90

Covers—First 50—$1.00. Additional, 1c each.

Plates—40c per 100.

MYCOLOGIA

VOL. III NOVEMBER, 1911 No. 6

THE AGARICACEAE OF TROPICAL NORTH AMERICA—IV

WILLIAM A. MURRILL

All of the tropical genera with rose-colored spores are treated in this article. Those growing mostly on dead wood, like *Pluteus,* are well represented; while those growing normally in the soil, like *Entoloma,* have few tropical species. The probable reason for this has been discussed in a previous article. As may be seen from the following key, only one of the genera is provided with a volva, and this contains few species. None of the species possesses an annulus. The principal characters used in distinguishing genera are the attachment of the gills and the consistency of the stipe, which may at times leave the position of a species rather in doubt.

Volva and annulus wanting.	
Stipe slender, cartilaginous.	
Margin of pileus incurved when young.	
Lamellae adnate or adnexed.	1. LEPTONIELLA.
Lamellae decurrent.	2. ECCILIA.
Margin of pileus straight and appressed when young; lamellae free or adnexed.	3. NOLANEA.
Stipe fleshy, usually stout.	
Lamellae free.	4. PLUTEUS.
Lamellae sinuate or adnexed.	5. ENTOLOMA.
Lamellae decurrent.	6. PLEUROPUS.
Volva present, annulus wanting.	7. VOLVARIOPSIS.

1. LEPTONIELLA Earle, Bull. N. Y. Bot. Gard. **5**: 424. 1909

Leptonia (Fries) Quél. Champ. Jura Vosg. 88. 1872. Not *Leptonium* Griff. 1843.

[MYCOLOGIA for September, 1911 (3: 207–269), was issued September 21, 1911]

This genus includes species with adnate or adnexed lamellae and cartilaginous stipe, the margin of the pileus being incurved when young instead of straight as in *Nolanea*. The plants are usually small, with attractive blue, gray, or purple coloring. Only two species have been previously described from our tropics.

1. **Leptoniella hypoporphyra** (Berk. & Curt.)

Agaricus (*Leptonia*) *hypoporphyrus* Berk. & Curt. Jour. Linn. Soc. **10**: 289. 1868.

Described from Wright's Cuban collections and found later in Guadeloupe by Duss. The spores are angular, 7–9 μ. The types at Kew are in poor condition.

2. **Leptoniella miniata** (Pat.)

Leptonia miniata Pat. Bull. Soc. Myc. Fr. **16**: 176. 1900.

Collected on dead trunks of various trees in Guadeloupe by Duss. Pileus red, striate; spores angular, 10–13 μ. Abundantly represented in Dr. Patouillard's herbarium.

3. **Leptoniella atrosquamosa** sp. nov.

Pileus broadly convex, slightly depressed, regular, solitary, 2 cm. broad; surface avellaneous, striate, clothed with innate, imbricate, fuliginous scales which are upturned at the end, the depressed umbo being decorated with black tufted scales; lamellae adnate, narrow, distant, about three times inserted, edges entire, concolorous; spores angular, 8–10 μ; stipe cylindric, equal, murinous, 3.5 cm. long, 2–3 mm. thick.

Type collected on dead wood at Morce's Gap, Jamaica, 5000 ft. elevation, December 30, 1908, *W. A. & Edna L. Murrill 708*. Resembling *L. serrulata* in general appearance.

4. **Leptoniella Earlei** sp. nov.

Pileus convex, umbilicate, thin, solitary, 2 cm. broad; surface pale-tan, subfurfuraceous, the disk scaly, margin thin, not striate; lamellae adnexed, distant, broad, dirty-pink, heterophyllous; spores angular, irregular, 10–13 × 7–8 μ; stipe cylindric, glabrous, subpruinose above, slightly paler than the pileus, hollow, 4 cm. long, 2 mm. thick.

Type collected on the ground in woods on El Yunque, Cuba, 1800 ft., March, 1903, *Underwood & Earle 427*.

5. **Leptoniella cinchonensis** sp. nov.

Pileus thin, irregular, convex, umbilicate, gregarious, 2–2.5 cm. broad, less than 1 cm. high; surface dry, striate, avellaneous, fuliginous at the center, margin lobed; lamellae adnate, rather broad and distant, pale-russet; spores angular, uninucleate, 10–12 × 7–9 μ; stipe cylindric, smooth, fumosous, slightly tapering upward, 3 cm. long, 2.2 mm. thick.

Type collected on the ground on a shaded bank at Cinchona, Jamaica, 5000 ft. elevation, December 25–January 8, 1908–9, *W. A. & Edna L. Murrill 562.*

6. **Leptoniella mexicana** sp. nov.

Pileus convex to expanded, umbilicate, gregarious, 1.5 cm. broad; surface smooth, silky-fibrillose, pale-avellaneous, margin thin, fragile; lamellae adnate, broad, distant, heterophyllous, pale ashy-gray with a slight rosy tint; spores polygonal, uninucleate, 7 × 4.5–5 μ; stipe slightly larger below, concolorous, glabrous, cartilaginous, 2.5 cm. long, 1.5 mm. thick.

Type collected on the ground in humus in a coffee plantation near Orizaba, Mexico, January 10–14, 1910, *W. A. & Edna L. Murrill 837.*

2. ECCILIA (Fries) Quél. Champ. Jura Vosg. 90. 1872
Hyporhodius Schröt. Krypt. Fl. Schles. 3[1]: 613. 1889.

A small genus readily distinguished by its cartilaginous stipe and decurrent gills. One species, *E. rhodocylix*, has been reported from Cuba and Bermuda, but such tropical material as I have seen so determined does not agree with the European plant.

1. ECCILIA ATRIDES (Lasch) Quél. Champ. Jura Vosg. 90. 1872

A well-known European and temperate North American species reported as far south as North Carolina. The edges of the gills are black and denticulate; spores angular, 7–9 μ.

Troy and Tyre, Jamaica, *W. A. Murrill & W. Harris 1069;* Jalapa, Mexico, *W. A. & Edna L. Murrill 77.*

2. **Eccilia cubensis** sp. nov.

Pileus convex, 1 cm. broad; surface dark-tan, darker at the disk, innate-scaly, not striate; lamellae decurrent, rather distant,

broad, dirty-white to slightly pinkish; spores octahedral, irregular, 7–9 μ; stipe cylindric, paler than the pileus, slightly granular-floccose, 2 cm. long, 1 mm. thick.

Type collected in a thicket on the bank of a stream near Herradura, Cuba, October 14, 1906, *F. S. Earle 554*.

3. **Eccilia Earlei** sp. nov.

Pileus thin, convex-umbilicate, 2 cm. broad; surface pale-tan, fibrillose-scaly, margin thin, substriate; lamellae decurrent, distant, broad, subarcuate, yellow to pinkish; spores irregularly angled, 7–9 μ; stipe cylindric, hollow, glabrous, dull-yellow, 4 cm. long, 2 mm. thick.

Type collected on a dead stick on El Yunque, Cuba, 1800 ft., March, 1903, *Underwood & Earle 428*.

4. **Eccilia jamaicensis** sp. nov.

Pileus thin, convex, umbilicate, solitary, nearly 2 cm. broad; surface smooth, glabrous, blackish, margin entire, concolorous; lamellae broad, distant, decurrent, straw-yellow; spores angular, pinkish, 8–10 $\times$ 7 μ; cystidia none; stipe equal, hollow, flattened on drying, cartilaginous, glabrous, ardesiacous, 2 cm. long, 2 mm. thick.

Type collected on decayed wood at Chester Vale, Jamaica, 3000 ft., December 21–24, 1908, *W. A. & Edna L. Murrill 367*.

3. NOLANEA (Fries) Quél. Champ. Jura Vosg. 89. 1872

This genus has a cartilaginous stipe, free or adnexed gills, and a campanulate cap with straight margin. Berkeley described one species from Bermuda, and reported one of our northern species, *N. Babingtonii*, from Cuba. Several species appear to occur in South America.

1. NOLANEA HELICTA (Berk.) Sacc. Syll. Fung. **5**: 729. 1887

Agaricus (*Nolanea*) ***helictus*** Berk. Jour. Linn. Soc. **15**: 48. 1877.

Collected by the Challenger Expedition on rotten leaf-mould in Bermuda. Several type specimens are at Kew. The name refers to the twisted stipe.

2. **Nolanea cubensis** sp. nov.

Pileus thin, convex to subexpanded, subumbonate, 2–3 cm. broad; surface pale-fuscous, minutely silky-fibrillose, at length rimose, striate to the umbo; lamellae free, crowded, rather broad, ventricose, white to pale-roseous; spores subglobose, smooth, 6 μ; cystidia none; stipe cylindric, solid, white, glabrous above, brownish-flocculose at the base, 3 cm. long, 2 mm. thick.

Type collected on a piece of board on the ground in a coffee grove at Santiago de las Vegas, Cuba, August 29, 1904, *F. S. Earle 155.*

3. **Nolanea jamaicensis** sp. nov.

Pileus campanulate with conic umbo, about 4 cm. broad; surface striate, glabrous, avellaneous, umbrinous to fuliginous at the umbo, margin entire, concolorous; lamellae rather broad, close, adnexed, salmon-colored from the copious spores, which are angular, somewhat longer than broad, 9–11 × 7–9 μ; stipe cylindric, equal, smooth, glabrous, pale-avellaneous, 6 cm. long, 3 mm. thick.

Type collected at Cinchona, Jamaica, December 25–January 8, 1908–9, *W. A. & Edna L. Murrill 566.*

4. PLUTEUS Fries, Gen. Hymen. 6. 1836

This genus is best known through its large and common representative, *P. cervinus.* The lamellae are free, the stipe fleshy or fibrous, and most of the species are found on decayed wood. The spore characters are similar throughout the genus. Cystidia occur rarely, and in one species they are peculiar in having the apex divided into two or more points.

1. PLUTEUS CERVINUS (Schaeff.) Quél. Champ. Jura Vosg. 81. 1872

Abundant in various forms throughout the United States and Europe on decayed wood and sawdust piles. Spores ellipsoid, smooth, 7–8 × 5–6 μ; cystidia bottle-shaped, large and conspicuous, divided at the apex into two, three, or more points. The tropical stations given below are all at 5000 ft. elevation.

Cinchona, Jamaica, *W. A. & Edna L. Murrill 452, 602;* Jalapa, Mexico, *W. A. & Edna L. Murrill 164;* Cuernavaca, Mexico, *W. A. & Edna L. Murrill 380.*

2. **Pluteus reticulatus** sp. nov.

Pileus plane to depressed, umbonate, solitary, 5 cm. broad, about 1 cm. thick; surface velvety, dark-isabelline with pale-fuliginous reticulations, which are more pronounced on the umbrinous umbo; lamellae free, ventricose, salmon-colored; spores subglobose, smooth, uninucleate. 4–5 × 3.5–4 μ; cystidia fusiform, pointed, not divided at the apex, rather abundant, about 60 × 17 μ; stipe cylindric, subequal, glabrous, stramineous with a pale-melleous tint, 4 cm. long, 5 mm. thick.

Type collected on dead wood near Moneague, Jamaica, about 2000 ft., January 17–18, 1909, *W. A. Murrill 1159*.

3. PLUTEUS NITENS Pat. Bull. Soc. Myc. Fr. **14**: 53. 1898

Type collected by Paul Maury on dead wood at Motzorongo, Mexico, February 12–25, 1891. The original specimens, accompanied by a drawing, are in the herbarium of Dr. N. Patouillard, in Paris.

Motzorongo, Mexico, *Maury, W. A. & Edna L. Murrill 1028, 1055;* Santiago de las Vegas, Cuba, *Earle 260, 501*.

4. **Pluteus Earlei** sp. nov.

Pileus rather thick, expanded, somewhat gibbous, 10 cm. broad; surface dry, densely floccose, uniformly pale-yellow, margin even, not striate; lamellae free, crowded, broad, becoming dull-pinkish; spores regular, ovoid, smooth, uninucleate, dark-pink when fresh, 7–8 × 6 μ; cystidia none; stipe slightly tapering upward, solid, white, glabrous, 8 cm. long, 1 cm. thick.

Type collected on a dead log near Guanajay, Cuba, September 14, 1904, *F. S. Earle & P. Wilson 1525*. Similar to *Pluteus cervinus* in size and shape, but differing in several important characters.

5. **Pluteus rimosus** sp. nov.

Pileus conic to convex, 4–5 cm. broad, 2–3 cm. high, gregarious; surface fuliginous when young, becoming umbrinous, smooth, glabrous, at length radiate-rimose and showing white in the cracks; lamellae free, close, rather narrow, white, becoming roseous from the spores; spores regular, globose, smooth, uninucleate, 4 μ; cystidia none; stipe white, glabrous, much enlarged below, crooked, 4.5 cm. long, scarcely 1 cm. thick above, 2 cm. thick at the base.

Type collected in a field near the shore east of Port Antonio, Jamaica, on soil mixed with decayed wood, December 17, 1908, *W. A. Murrill 214.*

6. **Pluteus multistriatus** sp. nov.

Pileus convex, depressed about the umbo, somewhat clustered, 3 cm. broad; surface fuliginous, subglabrous, with numerous shallow furrows, or striations, extending from the umbo to the margin; lamellae free, close, broad, pallid; spores globose or subglobose, smooth, uninuculeate, 5–7 μ; cystidia none; stipe slender, equal, glabrous, white, 4 cm. long, 2–3 mm. thick.

Type collected on a decayed railway tie at Jalapa, Mexico, 5000 ft., December 12–20, 1909, *W. A. & Edna L. Murrill 111.* No. 112 of the same collection represents depauperate forms of this species.

7. **Pluteus Harrisii** sp. nov.

Pileus convex to depressed, obtuse, 2–3 cm. broad; surface avellaneous-fuliginous to dark-chestnut, glabrous, subrugose, finely asperate and striate; lamellae free, subcrowded, slightly ventricose, white to salmon; spores broadly ellipsoid to subglobose, regular, smooth, uninucleate, about 7 μ long, rarely 9 μ, and 5–6 μ broad; cystidia none; stipe cylindric, solid, white, glabrous, shining, 3–4 cm. long, 2–3 mm. thick.

Type collected on dead wood in Troy and Tyre, Jamaica, 2000 ft., January 12–14, 1909, *W. A. Murrill & W. Harris 956.* Also collected on El Yunque, Cuba, 1800 ft., March, 1903, *Underwood & Earle 425.*

8. PLUTEUS ALBORUBELLUS (Mont.) Pat. Bull. Soc. Myc. Fr. **15**: 196. 1899

Agaricus (*Mycena*) *alborubellus* Mont. Ann. Sci. Nat. IV. **1**: 96. 1854.

Originally described from French Guiana, and later collected in Guadeloupe by Duss, on dead branches of *Bignonia.*

9. PLUTEUS LAETIFRONS (Berk. & Curt.) Sacc. Syll. Fung. **5**: 677. 1887

Agaricus (*Pluteus*) *laetifrons* Berk. & Curt. Jour. Linn. Soc. **10**: 289. 1868.

Collected by Wright on rotten wood in Cuba. Pileus about

5–10 mm. broad, glabrous, radiate-striate, orange-red; lamellae yellow; stipe slender, glabrous, red.

10. **Pluteus jamaicensis** sp. nov.

Pileus thin, expanded, obtuse, subcespitose, 1–3 cm. broad; surface dark-brown, paler with age, rugose, crustose-areolate, not striate; lamellae free, subcrowded, broad, ventricose, white to pink; spores globose, smooth, 4 μ; cystidia none; stipe enlarged above and below, solid, glabrous expect at the base, which is conspicuously whitish-tomentose, 2 cm. long, 2 mm. thick.

Type collected on rotten wood at Castleton Gardens, Jamaica, October 28, 1902, *F. S. Earle 220.* The dried plants resemble closely the faded type specimens of *P. laetifrons* at Kew, but the two species are very dissimilar in a fresh condition.

11. PLUTEUS TEPHROSTICTUS (Berk. & Curt.) Sacc. Syll. Fung. **5**: 669. 1887

Agaricus (*Pluteus*) *tephrostictus* Berk. & Curt. Jour. Linn. Soc. **10**: 289. 1868.

Collected by Wright on the under side of old logs in Cuba. The types at Kew are in poor condition. Pileus 1.2 cm. broad, umbonate, white, covered with a black, glandular pubescence.

12. PLUTEUS AETHALUS (Berk. & Curt.) Sacc. Syll. Fung. **5**: 674. 1887

Agaricus (*Pluteus*) *aethalus* Berk. & Curt. Jour. Linn. Soc. **10**: 289. 1868.

Described from plants collected by Wright on rotten wood in Cuba. Pileus date-brown, less than 1 cm. broad; spores globose, 5 μ. Two small type specimens are preserved at Kew.

Cuba, *Wright 50;* Tepeite Valley, Mexico, *W. A. & Edna L. Murrill 471.*

DOUBTFUL SPECIES

Pluteus leoninus (Schaeff.) Quél. Champ. Jura Vosg. 82. 1872. A temperate species reported from Guadeloupe by Duss, but specimens not examined.

5. ENTOLOMA (Fries) Quél. Champ. Jura Vosg. 83. 1872

Rhodophyllus Quél. Ench. Fung. 57. 1886.

This genus differs from *Pluteus* in having sinuate or adnexed lamellae, corresponding to *Tricholoma* in the white-spored series. The species are abundant in temperate regions, but none have heretofore been reported from tropical America.

1. ENTOLOMA MURRAII (Berk. & Curt.) Sacc. Syll. Fung. **14**: 127. 1899

Agaricus (*Entoloma*) *Murraii* Berk. & Curt. Ann. Mag. Nat. Hist. III. **4**: 289. 1859.

First collected in New England by Murray, and later found as far north as Maine and as far south as Alabama. With the habit and brilliant coloring of *Hydrocybe*, it unites a peculiar shape and remarkable many-angled or irregularly stellate spores. The coloring and striation of the cap varies with age, climate, etc.

Morce's Gap, Jamaica, *W. A. & Edna L. Murrill 676;* Sir John Peak, Jamaica, *W. A. Murrill 794;* Troy and Tyre, Jamaica, *W. A. Murrill & W. Harris 881;* Rose Hill, Jamaica, *F. S. Earle 289;* British Honduras, *Morton E. Peck.*

2. **Entoloma cinchonensis** sp. nov.

Pileus hemispheric, slightly depressed at the center, solitary, 1–1.5 cm. broad; surface smooth, dry, subglabrous, ochroleucous; margin very thin, sometimes eroded; lamellae sinuate, broad, rather close, heterophyllous, pale-citrinous to salmon-colored, edges notched or irregular; spores subglobose to ovoid, smooth, 4–5 × 3–3.5 μ; stipe slightly tapering upward, smooth, glabrous, cremeous above, ochraceous below, 1.5 cm. long, 1.5 mm. thick.

Type collected on much decayed wood at Cinchona, Jamaica, 5000 ft. elevation, December 25–January 8, 1908–9, *W. A. & Edna L. Murrill 661.* Also collected on dead wood at Morce's Gap, Jamaica, 5000 ft. elevation, near Cinchona, December 29–January 2, 1908–9, *W. A. & Edna L. Murrill 687.*

6. PLEUROPUS Roussel, Fl. Calvados ed. 2. 67. 1806

Clitopilus (Fries) Quél. Champ. Jura Vosg. 87. 1872.

Rhodosporus Schröt. Krypt. Fl. Schles. 3^1: 617. 1889.

This genus has a fleshy or fibrous stem and decurrent gills. It is represented by a number of temperate species, but has heretofore been unknown in tropical America.

1. **Pleuropus abortivus** (Berk. & Curt.)

Agaricus (*Clitopilus*) *abortivus* Berk. & Curt. Ann. Mag. Nat. Hist. III. **4**: 289. 1859.

Clitopilus abortivus (Berk. & Curt.) Sacc. Syll. Fung. **5**: 701. 1887.

This species, originally described from Sprague's collections in New England and known to occur from Canada to Alabama and west to Wisconsin, is peculiar in having aborted sporophores more frequently than normally developed ones. These irregularly globose abortions, distantly resembling puff-balls, were found in the market at Jalapa, having been collected in the surrounding forests by the Indians for food.

Jalapa, Mexico, *W. A. & Edna L. Murrill 194;* Tepeite Valley, Mexico, *W. A. & Edna L. Murrill 476.*

2. **Pleuropus Earlei** sp. nov.

Pileus thin, firm, convex to subexpanded, umbilicate, gregarious, 1–2 cm. broad; surface pure-white, glabrous, margin entire, inrolled when young; lamellae short-decurrent, subcrowded, narrow, irregular, pure-white to pink; spores angular, 7×5–$6\,\mu$; stipe short, subequal, often flattened, pure-white, fistulose, minutely pruinose to glabrous, surrounded at the base with whitish mycelium, 2–3 cm. long, 2–3 mm. thick.

Collected on the ground in a banana field at Santiago de las Vegas, Cuba, from May to September, 1904, *F. S. Earle 31 (type), 70, 179.* The fresh specimens have a strong odor of wild onions.

7. **Volvariopsis** nom. nov.

Volvarius Roussel, Fl. Calvados ed. 2. 59. 1806. *Volvaria* (Fries) Gillet, Champ. Fr. **1**: 385. 1878. Not *Volvaria* DC. 1805.

The type of this genus is *Volvaria volvacea* (Bull.) Quél. The species are largely temperate, and form a natural group with distinctive characters, corresponding to *Amanitopsis* in the white-spored series. Only one species, *V. bombycina,* has heretofore been reported from tropical America. *Locellina hiatuloides* Pat., described from Guadeloupe, has the form and appearance of a species of this genus, but the spores are ochraceous. It is just possible that their color has become changed in drying.

1. **Volvariopsis bombycina** (Schaeff.)

Volvaria bombycina (Schaeff.) Quél. Champ. Jura Vosg. 80. 1872.

This very handsome species occurs on decayed trunks of hardwood trees from New England to Florida and west to California in the United States. It is also well-known in Europe and was collected by Wright in Cuba. The surface of the pileus is white and silky-fibrillose; the spores are broadly ellipsoid, 6–8 × 5–6 μ.

Valparaiso, Cuba, *Wright 63;* Herradura, Cuba, *F. S. Earle 564;* Guane, Pinar del Rio, Cuba, *N. L. Britton, E. G. Britton & J. F. Cowell 980.*

2. **Volvariopsis Bakeri** sp. nov.

Pileus fleshy, ovoid to convex, densely gregarious, reaching a breadth of 10 cm.; surface dark-fuliginous, becoming much lighter with age, appressed-fibrillose from the cracking of the cuticle, not striate; context white, with mild taste and no appreciable odor; lamellae free, crowded, not very broad, white, becoming pink; spores broadly ellipsoid, rarely ovoid, smooth, roseous, 6–8 × 4–5 μ; stipe tapering upward, white, glabrous, solid, 8–9 cm. long, 1–1.5 cm. thick; volva free, open, dark-fuliginous, 3–4 cm. long, 2–3 cm. broad.

Type collected on a dead banana stump at Santiago de las Vegas, Cuba, May 19, 1906, *C. F. Baker* (*F. S. Earle 521*).

3. **Volvariopsis jamaicensis** sp. nov.

Pileus thin, convex to nearly plane, gregarious, 5 cm. broad; surface ashy-white, avellaneous at the center, radiate-striate, slightly granular, margin thin, entire; lamellae free, close, narrow, white to salmon-colored; spores narrowly ellipsoid, smooth, uninucleate, about 5 × 3 μ; stipe curved, slightly tapering upward, glabrous, whitish, hollow, with a tough rind, 5 cm. long, 3–5 mm. thick; volva rather delicate, narrow, avellaneous, 1–2 cm. long.

Type collected on the decaying roots of an upturned tree in a virgin forest near Moore Town, Jamaica, 800 ft. elevation, December 16, 1908, *W. A. & Edna L. Murrill 150.*

4. **Volvariopsis cubensis** sp. nov.

Pileus firm, fleshy, rather tough, irregularly expanded, obtuse, solitary, 7 cm. broad, with strong, unpleasant odor; surface dark

smoky-brown, minutely fibrillose, not striate, the disk seal-brown and glabrous; lamellae free, distant, subcrowded, rather broad, subventricose, heterophyllous; spores ellipsoid, smooth, uninucleate, about $5.5 \times 3.5 \mu$; stipe subcylindric, slightly enlarged above and below, concolorous but paler, glabrous, solid, tough, apex pallid, 6–7 cm. long, 7 mm. thick; volva thick and fleshy, cup-shaped, distant, bifid, concolorous.

Collected on the ground in a banana field at Santiago de las Vegas, Cuba, May, September, and October, 1904, *F. S. Earle 17 (type), 180.*

5. **Volvariopsis Earlei** sp. nov.

Pileus fleshy, rather thin, becoming expanded, solitary or gregarious, 4–5 cm. broad; surface glabrous, rarely with thin volval patches, white, discolored with age, margin even or slightly striate; lamellae free, subcrowded, of medium breadth, ventricose, white to pink; spores ellipsoid, smooth, both nucleate and granular, about $11 \times 7 \mu$; stipe subcylindric, slightly tapering upward, glabrous, pure-white, solid, 5–10 cm. long, 5–8 mm. thick; volva delicate, sheathing, very short, 5–8 mm. in length.

Collected on the ground in a banana field at Santiago de las Vegas, Cuba, June and September, 1904, *F. S. Earle 45 (type), 103, 168.* No. 103 represents a shorter and heavier form with a more strongly developed volva; the pileus is also pale-grayish instead of pure-white, but microscopic and other characters agree closely.

NEW YORK BOTANICAL GARDEN.

SCHIZOSACCHAROMYCES OCTOSPORUS

W. C. Coker and Louise Wilson

(With Plate 55, Containing 25 Figures)

In the course of some special work on wild and domestic yeasts during the fall of last year (1910) we were surprised to discover in Chapel Hill a member of the rare genus *Schizosaccharomyces* Lindner. The species appeared in the following manner: Unbroken Delaware grapes bought in the Chapel Hill market were put in a test tube, covered with distilled water, and set aside. Slow fermentation started up and a precipitate began to appear. After three weeks, an examination of the precipitate showed all stages of development, both vegetative and reproductive. A close examination showed the species to be *Schizosaccharomyces octosporus* Beyerinck. Cultures were made from this in various solutions and in most cases spore formation was secured. Fresh cultures of this yeast were also obtained later from California Tokay grapes, using the same method as with the Delaware grapes.

The genus *Schizosaccharomyces* is a small one proposed by Lindner* in 1893 to include those forms of conjugating yeast-like fungi which multiply vegetatively not by budding, as in other yeasts, but by fission, as in most cell division. The species *S. Pombe* was the first to be discovered and is the one on which the genus was founded. Since that time three other species of the genus have been described: *S. octosporus* Beyerinck,† *S. mellacei* (Jörg.) Lindner,‡ and *S. asporus* Eyckmann. Of these, *S. Pombe* and *S. mellacei* produce only four spores in conjugation, while in *S. asporus,* as the name implies, spore formation seems to be suppressed.

The members of this genus form a peculiar group of yeasts hitherto found only in hot countries, and so far little known. *S. mellacei* was found in Jamaica, *S. Pombe* in tropical Africa,

* Wochenschr. f. Braueri **10**: 1298. 1893.

† Centralblatt f. Bacteriol. **16**: 49.

‡ Mikr. Betriebs-kontr. Berl. 404. 1901.

and *S. octosporus* on old currants presumably from Greece. The appearance of the last at Chapel Hill is the first reported occurrence, so far as we know, of any of the genus on the American continent. Schiönning* was the first to publish observations on the conjugation of *S. octosporus*. He found that the cells destined to form the ascus divide into daughter cells which do not separate completely, but remain attached at a certain point. After some time the partition at the point of attachment is absorbed and the two sister cells fuse to form an ascus with eight spores.

Guilliermond† in 1903 confirmed these observations in large part but thought that while the fusion may take place simply by the solution of the partition wall it is generally brought about by the formation of two short projections just above the point of contact, which meet at their tips and fuse.‡

Guilliermond also studied the nuclear behavior and found that the two nuclei fuse in conjugation and then divide into eight daughter nuclei around which the eight spores are formed. This, then, is to all appearances a true case of isogamous sexual reproduction. In a later paper§ Guilliermond reports further observations on this yeast and thinks he has exaggerated a little in saying that it is always sister cells that fuse. From certain appearances, which he figures, he thinks that the fusing cells may occasionally be separated from each other by several cell divisions.

In our study of the development of *Schizosaccharomyces octosporus*, extending over several months, we largely confirmed the observations of the authors above mentioned. However, we saw no indication whatever of fusion between any but sister cells, nor any sign of conjugation through projecting tubes or processes. In plate LV, we give a series of drawings showing conjugation (figs. 14 to 25). The condition shown in figs. 17, 18 and 25 is not due in our opinion to the fusion of elongated processes, but to the drawing out of the cells after fusion. The typical series is perhaps best represented by figures 14, 15, 16, 20 and 21. Where

* Compt. Rend. des Brau. Lab. Carlsberg. 4: 1895. We have not been able to see this paper.

† Rev. Gen. de Bot. 15: 1903.

‡ This method reminds us of the conjugation in certain species of *Spirogyra* where neighboring cells may fuse by such a projection.

§ Rev. Gen. de Bot. 17: 337. 1905.

the cells divide in vegetative reproduction they do not break away all along the line, but bend back and remain attached by one corner. After a time they break away entirely and repeat the process. Figs. 1 to 10 show a reproductive series of forms and stages in ordinary growth and multiplication.

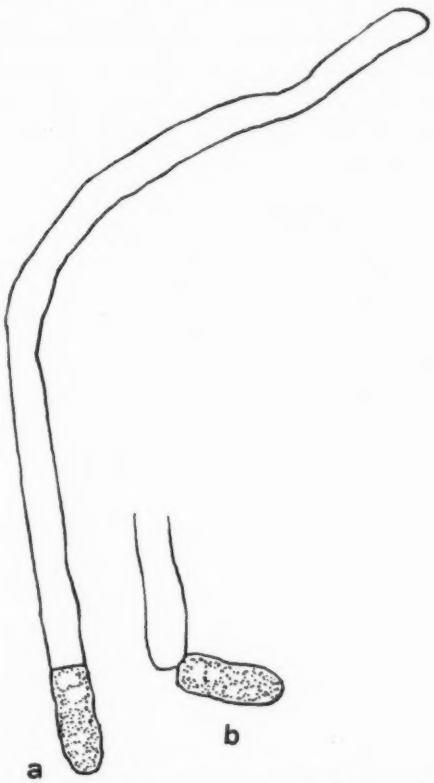


FIG. 1. An elongated hypha of *S. octosporus* cutting off a normal cell at its tip. × 670.

Even in normal vegetative growth the size of the cell varies considerably, and when food begins to fail many of the cells extend their growth into elongated hyphae which formed a conspicuous part of the mass. In fig. 13 is shown the beginning of such a hypha. As the hypha elongates the protoplasm is usually

confined to one end, where growth alone proceeds. After a time this protoplasm collects more closely into the tip and is cut off by a cross wall. This tip cell then bends around just as in ordinary division, and remains for a time attached by a point. Later it drops away and becomes a vegetative cell of normal size. In text fig. 1a, such a hypha is shown with its protoplasm cut off at one end. While this figure was being drawn the end cell was seen to bend back as shown in text fig. 1 b. Occasionally there may be seen long rows of cells as shown in text fig. 2 recalling certain figures of Lindner's for *S. Pombe*. These finally break up into separate cells.

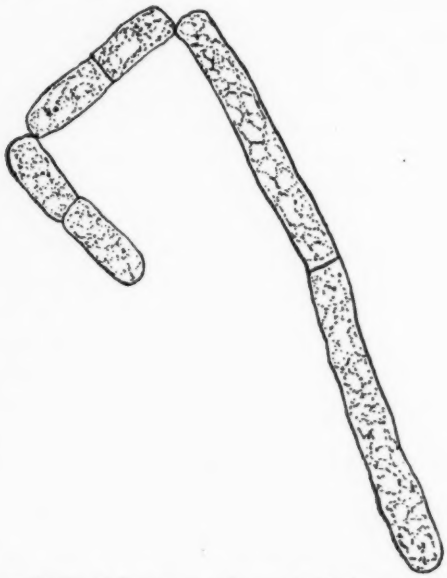
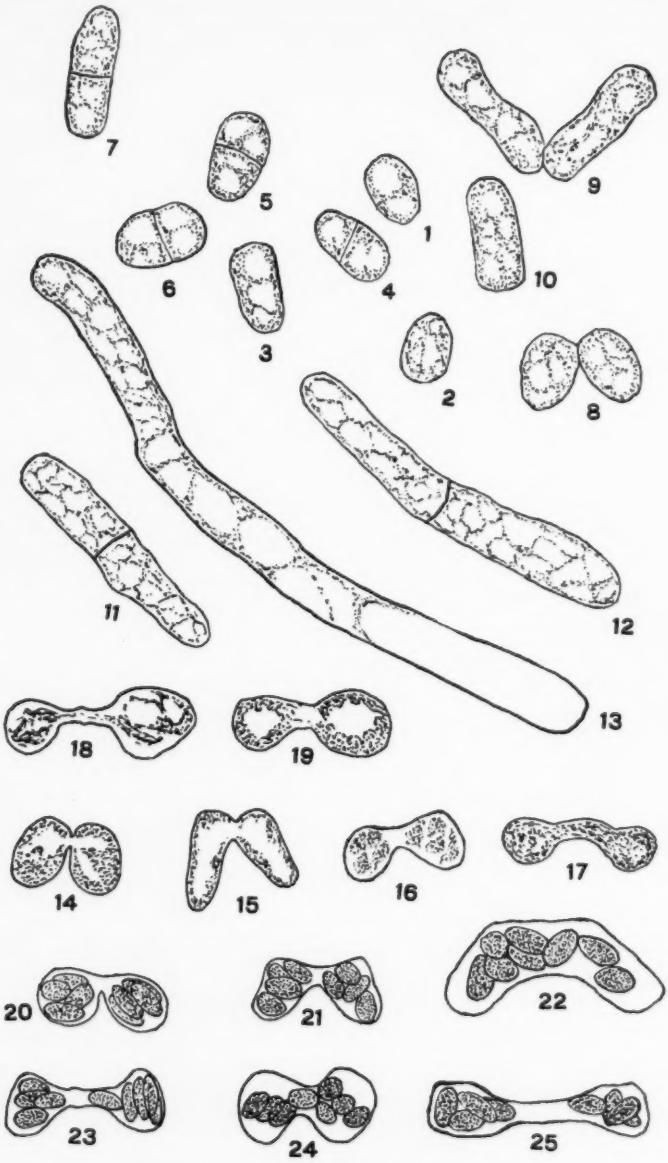


FIG. 2. Elongated cells of *S. octosporus* in rows beginning to separate. × 1080.

When fusion is to take place the procedure is exactly the same as in vegetation cell division, up to the point of the bending back of the cells. Then, instead of separating, the partition becomes absorbed and the contents of the two cells fuse. Usually, the original position of the cell is retained and the result is the formation of a double sac that resembles a pair of saddle bags (figs.



SCHIZOSACCHAROMYCES OCTOSPORUS

20, 21). This shape may be variously modified as shown in the figures. A dumbbell form is frequently seen.

In a recent paper* Guilliermond gives a good review of our present knowledge of spore formation, in the yeasts. Among them sexuality is known to appear in two ways. In *Schizosaccharomyces, Zygosaccharomyces,* and *Debaryomyces,* there is a fusion of cells before spore formation. In *Saccharomyces Ludwigii, Willia Saturnus,* and *yeast of Johannisberg II,* there is no fusion preceding the formation of spores, but the spores fuse during the act of sprouting. In a number of other cases spores are formed but there is no conjugation either before or after.

CHAPEL HILL, N. C.

EXPLANATION OF PLATE 55

Schizosaccharomyces octosporus Beyerinck

Figures 1–11. Normal stages of vegetative growth and division. × 1080.

Figures 12, 13. Elongated forms showing the beginning of hyphal development. × 1080.

Figures 14–25. Stages in conjugation and spore formation. × 1080.

* Ann. Myc. 8: 287. 1910.

THE RUSTS OF GUATEMALA—II*

FRANK D. KERN

The first article of this series was published in 1907 in the Journal of Mycology, vol. 13, pp. 18–26. The general introductory remarks used there apply equally well to the present paper but since a considerable time has intervened it may be well at this time to again call attention to the principal points. The specimens upon which both papers have been based were collected in Guatemala by the late Professor W. A. Kellerman (except one specimen by Professor Wm. Trelease) and placed in the hands of the writer for identification and study. Professor Kellerman made in all four excursions for the collection and study of the Guatemalan flora. So rich were his collections of the rusts, however, that specimens secured during the first two excursions (with one or two exceptions) have sufficed for both this and the earlier report and there still remains a number which have not yet been determined.

RAVENELIA MIMOSAE-ALBIDAE Dietel.—— On *Mimosa albida floribunda* Rab. (host no. 5222, det. by B. L. Robinson), Antigua, Depart. Sacatepéquez, Feb. 18, 1905, no. *5360*.

CIONOTHRIX PRAELONGA (Winter) Arth.—On *Eupatorium populifolium* H.B.K. (host det. by J. M. Greenman), Los Amates, Depart. Izabal, alt. 90 m., March 15, 1905, nos. *5301*, *5302*.

CALLIOSPORA DIPHYSAE Arth.—On *Diphysa* sp., Palmar, Depart. Quezaltenango, Feb. 11, 1906, no. *5459*.

A little known but characteristic species hitherto known only from the type locality, Rio Blanco, Guadalajara, Mexico.

PUCCINIA GREGARIA Kunze.—On *Xylopia* sp., Los Amates, Depart. Izabal, alt. 90 m., March 15, 1905, no. *5330*.

A very interesting species because of the odd characters of the teliospores. The apex of the upper cell and the base of the lower cell have the wall thickened and over these areas the spinulose papillae are much longer than on the sides. The species has

* Contributions to Guatemalan Mycology—V. (The first three papers in this series were by W. A. Kellerman, the fourth by the writer.)

also been called *Dasyspora faveolata* by Berkeley and Curtis and is the type of their genus *Dasyspora*, which has been maintained by Arthur to include the *Puccinia*-like species which possess only pycnia and telia in their life-cycle. The Guatemalan specimen has pycnia accompanying the telia.

PUCCINIA LIPPIAE Speg.—On *Lippia myriocephala* Cham. & Schlecht. (host no. 5209, det. by John Donnell Smith), Laguna, Depart. Amatitlan, alt. 1200 m., Jan. 20, 1906, no. *5451* (in part).

The teliospores of this species are also very unusual on account of the whorls of branched appendages near the base of the pedicels.

PUCCINIA POLYGONI-AMPHIBII Pers.—On *Polygonum* sp., Laguna, Depart. Amatitlan, Jan. 25, 1906, no. *5302*.

PUCCINIA INANIPES Diet. & Holw.—On *Eupatorium tubiflorum* Benth. (host no. 5195, det. by J. M. Greenman), Volcano Atitlan, Depart. Solalá, Feb. 16, 1906, no. *5314*.

PUCCINIA ELEOCHARIDIS Arth.—On *Eleocharis* sp., Palmar, Depart. Quezaltenango, Feb. 11, 1906, no. *5419*.

UROMYCES APPENDICULATUS (Pers.) Fries.—On *Phaseolus atropurpurea* Moc. (host no. 4797), Laguna, Depart. Amatitlan, alt. 1200 m., Feb. 5, 1905, no. *5373*.

The host has been examined by J. K. Small, who is somewhat doubtful about the specific determination owing to its fragmentary condition.

UROMYCES LEPTODERMIS Sydow.—On *Panicum barbinode* Trin. (host det. by A. S. Hitchcock), Laguna, Depart. Amatitlan, alt. 1200 m., Feb. 5, 1905, no. *5364*.

UROMYCES PROËMINENS (DC.) Pass.—On *Euphorbia lasiocarpa* Klotzsch. (host det. by C. F. Millspaugh), Laguna, Depart. Amatitlan, alt. 1200 m., Jan. 17, 1906, no.*5404; E. adenoptera* Bertol, Los Amates, Depart. Izabal, alt. 90 m., Jan. 5, 1908, no. *7036*.

UROMYCES RUBI Diet. & Holw.—On *Rubus glaucus* Benth., Guatemala, Depart. Guatemala, alt. 1465 m., Feb. 12, 1905, no. *4625;* Antigua, Depart. Sacatepéquez, Feb. 18, 1905, nos. *5319, 5320, 5321; Rubus poliophyllus* Focke (host no. 4775), Antigua, Feb. 18, 1905, no. *5363;* Volcano Atitlán, Depart. Sololá, Feb. 16, 1906, no. *5415*.

Nos. *4625* and *5363* were erroneously reported in the first article (Jour. Myc. **13**: 20) as *Kuehneola albida*. It was noted there that the markings of the urediniospores of no. *5363* are much coarser than is typical in that species. This coarse spinosely-echinulate surface is characteristic of *U. Rubi*. The host of no. *5363* was determined by John Donnell Smith, all the others have been determined by P. A. Rydberg with an indication of some uncertainty in nos. *4625* and *5319*.

Uromyces Gouaniae sp. nov.—Pycnia and aecia unknown.

Uredinia hypophyllous, scattered, small, inconspicuous, punctiform, roundish, chestnut-brown; paraphyses encircling the sori, clavate or cylindrical, 10–16 × 30–40 μ, somewhat incurved, the wall colorless, thin, about 1 μ; urediniospores obovoid or broadly ellipsoid, 18–19 × 21–26 μ, the wall light cinnamon-brown, 1.5–2 μ thick, evenly and sparsely echinulate; pores 2, occasionally 3, superequatorial.

Telia resembling the uredinia, slightly darker; teliospores broadly ellipsoid or ovoid, 18–23 × 26–29 μ, the wall chestnut-brown, with a slightly paler umbo, moderately thick, 2–2.5 μ, thicker above, 4–5 μ, evenly and moderately verrucose; pedicel tinted, once to twice length of spore.

On *Gouania domingensis* L., Laguna, Depart. Amatitlan, alt. 1200 m., Jan. 25, 1906, no. *5391*.

There is no other species of *Uromyces* known on this or any closely related host. The general characters of this species are paralleled in a very interesting manner by *Puccinia Gouaniae* Holw., the important difference between the two being the number of cells in the teliospores. *Uredo Gouaniae* Ellis & Kelsey is doubtless the uredinial stage of *Puccinia Gouaniae* Holw. The host of the Guatemalan specimen has been determined by J. N. Rose.

AECIDIUM LORANTHI Thüm.—On *Loranthus* sp., Guatemala, Depart. unknown, Feb. *27*, 1902, *Wm. Trelease*.

UREDO MALVICOLA Speg.—On *Malvaviscus* (host no. 5238), Mazatenango, Depart. Suchitepéquez, alt. 330 m., Feb. 28, 1905, no. *5375*.

The host of this collection has been examined by J. N. Rose, who suggested this determination with some doubt owing to the very fragmentary condition of the specimen.

PURDUE UNIVERSITY,
LAFAYETTE, INDIANA.

NEWS AND NOTES

Dr. C. E. Fairman, of Lyndonville, New York, spent some time at the Garden in August consulting the library and mycological herbarium.

Mr. B. O. Dodge, of Columbia University, collected fungi in Bermuda in August, and later visited Whitepost, Virginia, to obtain certain fleshy species.

Dr. C. L. Shear, of the Department of Agriculture at Washington, spent September 18 and 19 at the Garden, consulting the Ellis Collection of fungi.

Mr. Wilmer G. Stover has been appointed assistant professor of horticulture and botany in the Agricultural and Mechanical College of Oklahoma.

Dr. Gertrude S. Burlingham spent the summer near West Wardsboro, Vermont, continuing her study of the genus *Russula* for North American Flora.

Dr. Bruce Fink, professor of botany at Miami University, Oxford, Ohio, spent most of August and a part of September at the Garden, continuing his studies of North American lichens.

According to Pantanelli, *Diaporthe parasitica* has been successfully inoculated into Italian chestnuts, and the strictest quarantine regulations have been recommended to prevent the introduction of this parasite into Italy.

Among the principal diseases of sugar cane considered by L. C. and A. Maublanc in a recent series of articles, *Schizophyllum commune, Marasmius Sacchari,* and *Ithyphallus impudicus* occupy an important place.

Through the experiments of Bonnier, Matruchot, and Combes (Compt. Rend. **152**: 652–659. 1911), it has been demonstrated that the air of forests contains nearly three hundred times as many spores of fungi as of bacteria, and that at high altitudes the number of spores of all kinds present in the air is much reduced.

A canker of the chestnut in southern Europe somewhat similar to that caused by *Diaporthe parasitica* in America, is claimed by Briosi and Farneti to be due to *Melanconis perniciosa*, which, according to these authors, is distinct from *Melanconis modonia* causing black canker of the chestnut in Brittany.

P. Vuillemin has called attention to a minute fungus, *Cicinnobolus Cesatii Euonymi*, which is parasitic on the oak oidium in the forests of France, and suggests that this prevalent disease may be held in check elsewhere by the introduction of the parasite. The oidium has been abundant in the eastern United States in recent years.

Dr. W. A. Murrill visited Stockbridge, Massachusetts, on September 4 and 5, and returned with a large number of fleshy fungi, collected with the assistance of Dr. W. Gilman Thompson and Mr. Hoffmann. The invasion of the chestnut canker at several points in the vicinity of Stockbridge was also investigated and specimens of infected branches secured.

A disease of plum trees known as "silver-leaf," caused by *Stereum purpureum*, has been investigated quite thoroughly in England by the Duke of Bedford and S. U. Pickering, who claim that the discoloration of the leaves is due to their cells becoming partially disconnected, owing to disturbance in nutrition by poisons formed by the growing fungus. No satisfactory treatment has been discovered.

Dr. H. D. House, of the Biltmore Forest School, has done considerable collecting the past season in Michigan and Oregon.

Fleshy fungi have been scarce, but a number of interesting woody forms have been found and studied in relation to their hosts. Dr. House remarks in a recent letter from Oregon that "except for *Ganoderma oregonense* and *Echinodontium tinctorium*, the woody fungi and wood-destroying fungi do not appear to differ much from those in the East, the same species being common."

The report of the state botanist, Dr. C. H. Peck, for 1910 is a pamphlet of 86 pages and 6 colored plates, containing descriptions of 22 new species of New York fungi and 31 new fungi from other states. *Boletus albus, Cantharellus aurantiacus, Lactarius camphoratus, Lactarius lignyotus,* and *Lycoperdon atropurpureum* are figured and described at length in continuation of a list of edible fungi. Among notes on species, *Clitocybe dealbata sudorifica* is described as causing profuse perspiration, having been used by Mr. Howland, of Saratoga Springs, to break up a cold. Very serviceable descriptive lists of the New York species of *Hypholoma* and *Psathyra* conclude this excellent report. Dr. Peck has been assisted in its preparation by Mr. S. H. Burnham.

The recent epidemic of mushroom poisoning, during which about thirty persons lost their lives within a few weeks in the vicinity of New York City alone, was undoubtedly due to the prevalence of the white form of the deadly amanita, or "destroying angel," in the groves and woodlands of this region. After the heavy and continued rains of the last week in August, following a prolonged drought, mushrooms of many kinds sprang up in great quantity, the white form of the deadly amanita being conspicuous because of its color and large size, as well as because of its abundance.

The fatalities were mainly among the ignorant and foreign-born, who, to my personal knowledge, often collect everything they find in the form of a fleshy mushroom as they scour a piece of woodland, at times leaving behind them the "cups" of the poisonous species imbedded in the soil. These same persons not only eat the specimens themselves, but also sell them to shopkeepers and share them with their friends. The white form of

Amanita phalloides, especially when young and broken away from its swollen base, does not appear so very different to these collectors from the common field mushroom, *Agaricus campestris*, which is often pure white above and has its vivid pink gills hidden from sight by the veil in the younger stages. The two species are, however, very widely distinct, and persons incapable of distinguishing them would do well to abandon at once the rôle of mycophagist.

INDEX TO VOLUME III

New names, and the final members of new combinations, are in **bold face type**

Abies balsamea, *72*
Acrostalagmus, 45
Aecidium, 159, 160; gracilens, 157, 159, 160; Loranthi, 290
Agaricaceae of tropical North America, The—I, *23*; II, *79*; III, 189; IV, *271*
Agaricus, 79, 89; abortivus, 280; aethalus, *278*; alborubellus, *277*; alphitophyllus, 91; apodactylus, 86; Bertieri, 31; caespitosus, *192*; Calyx, 30; campanulatus, *201*, *202*; campestris, *76*, *201*, 294; Cantharellus, 196; cepaestipes, 86; cheimonoceps, 86; cheimonophyllus, 91; cretaceus, 86; crinitus, *29*, 31; cristatus, 85; cubensis, 91; cyathiformis, *29*; dichropus, 193; edodes, *42*; guadelupensis, 89; helictus, *274*; hemisclerus, 87; hemispilus, *29*; hirtus, *29*; holoporphyrus, 193; hypoporphyrus, *272*; laetifrons, *277*; lepideus, *27*; leucoconis, 91; luteus, 86; melleorubens, 90; melleus, 90; Molybdites, 89; monadelphus, *192*; Morgani, 89; Murraii, *279*; oblectus, 167; omphalomorphus, 35; polymyces, 90; rubrotinctus, 88; russaticeps, *42*; silvicola, *77*; sordescens, 86; sordidus, 195; squamosus, *27*; strigosus, *29*; subantiquatus, 85; subclypeolarius, 87; tephrostictus, *278*; vaginatus, 80
Agave americana, 10
Alectoria, 106–108, 110, 111, 115, 116, 118, 126, 127, 129; bicolor, 109, 121, 123, 149; bicolor Berengeriana, 121, 124; californica, 113, 115, 116; cetrariza, 111–113; chalybeiformis, 108, 109, 119, 121, 122, 124, 125, 149; chalybeiformis prolixa, 127; cincinnati, 109, 142; crinalis, 145; dichotoma, 145; divergens, 108, 109, 112, 117, 124, 149, 150; divergens abbreviata, 127; Fremontii, 109, 128, 129, 132, 134, 136, 149, 150; implexa, 109, 120, 121, 129, 132, 136, 148; jubata, 109, 120–122, 127–129, 131, 132, 135, 136, 140, 148; jubata cana, 128; jubata chalybeiformis, 119, 128; jubata implexa, 128–131, 149; jubata lanestris, 121; jubata minuscula, 131, 132; jubata nitidula, 121; jubata prolixa, 128, 130; jubata stricta, 130; jubata subcana, 128, 131; luteola, 142; nidulifera, 121; nigricans, 109, 137, 150; ochroleuca, 109, 137–144, 147, 150; ochroleuca cincinnati, 108, 141, 150; ochroleuca osteina, 143; ochroleuca rigida, 140; ochroleuca tenuior, 139; oregana, 107–109, 113, 115, 116, 125, 132, 149, 150; osteina, 109, 143, 149; pacifica, 127; prolixa chalybeiformis, 119; prolixa lanestris, 125; sarmentosa, 110, 142, 144, 145, 149, 150; Thulensis, 138; tortuosa, 131, 147; virens, 110, 131, 147–149
Alectoria occurring north of the fifteenth parallel, American species of, 106
Allantospora, 170, 173; radicicola, 170
Alternaria **Forsythiae,** 154
Alternaria, A new species of, 154
Amanita, *24*, *77*, *79*, 175; echinata, 86; muscaria, 42, 80, 175–177, 180, 183, 185–187; phalloides, *77*, 175–177, *294*; rubescens, *92*; solitaria, 86; verna, *77*
Amanitopsis, *24*, 80, 280; vaginata, *92*
Amelanchier, 158, 160
American species of Alectoria occurring north of the fifteenth parallel, 106
Arguments of botanists concerning classification, Views and. The nature and classification of lichens—I, *231*
Armillaria, *42*; edodes, *42*; fracida, 91; mellea, 90, 193; umbilicata, 90
Armillariella, 90
Ascobolus, 61; Crec'hquerault ii, 58; denudatus, 61; immersus, 60; lignatilis, 61; stercorarius, 61; **xylophilus,** 61
Ascophanus argenteus, 60; carneus, 60; cinereus, 60; microsporus, 60
Aspergillus, 45, 172; affinis, 53; laneus, 48
Asterophora Clavus, *24*
Atestia, 107

Atriplex, 72–74; patula, 72; patula hastata, 73

Balansia, 207, 223; claviceps, 223; discoidea, 224; Hypoxylon, 223
Barlaea Constellatio, 58; Crec'hqueraultii, 58
Bartramia pomiformis, 206; Potosica, 206
Bethel, E., Notes on some species of Gymnosporangium in Colorado, 156
Bignonia, 277
Boletus albus, 293; Clintonianus, 77
Botanists concerning classification, Views and arguments of. The nature and classification of lichens—I, 231
Botrytis, 46; fulva, 52
Bresadolia caucasica, 41
Bryopogon, 107
Buchanan, R. E., A new species of Thyrococcum, 1; Morphology of the genus Cephalosporium, with description of a new species and a variety, 170
Bumelia lanuginosa, 7, 18
Burger, O. F., Fawcett, H. S. &, A gum-inducing Diplodia of peach and orange, 151

Calamagrostis, 221
Calicium, 256
Calliospora Diphysae, 288
Calyptospora columnaris, 67, 71
Campanularius **semiglobatus,** 103
Cantharellus, 24; aurantiacus, 293
Capriola Dactylon, 21
Capsicum annuum, 15
Carex, 37; nebraskensis, 38; stellulata angustata, 37, 38
Catathelasma, 43
Celtis mississippiensis, 11, 12; reticulata, 11
Cenangium populneum, 64
Cephalanthus occidentalis, 20
Cephalosporium, 170–173; **Pammelii,** 173, 174; **Pammellii purpurascens,** 173, 174
Cephalosporium, with description of a new species and a variety, Morphology of the genus, 170
Cercospora, 19; **adusta,** 14; **atricincta,** 14; **aurantia,** 15; **Capsici,** 15; **Chrysanthemi,** 15; **Crataegi,** 16; **Elaeagni,** 16; **Fici,** 16; **floricola,** 17; **fulvella,** 17; **lanuginosa,** 17; **Lythracearum,** 18; **macromaculans,** 18; **Malachrae,** 19; **obscura,** 19; **perniciosa,** 19; polymorpha, 19; **Prosopidis,** 20; **xanthicola,** 20
Cetraria, 107, 110, 115, 118, 127; aculeata, 108, 110, 111, 118, 127; californica, 110–113, 116, 149; californica sepincola, 113, 149; californica Tuckermanii, 116; saepincola, 116; tristis, 110, 111
Chamaedaphne, 67, 68; calyculata, 68, 69
Chamaemyces, 79, 91; **alphitophyllus,** 91, 199
Chanterel cinnabarinus, 24; infundibuliformis, 24; mexicanus, 24
Chenopodium, 73, 74; album, 73
Chiogenes, 67
Chloroneuron, 25; **viride,** 25
Chlorophyllum, 25, 79, 89; esculentum, 89, 90; Molybdites, 89; Morgani, 89; viride, 24, 25
Chlorosplenium aeruginosum, 62
Chrysanthemum, 15
Cicada, 219
Cicinnobolus Cesatii Euonymi, 292
Cintractia, 164
Cionothrix praelonga, 288
Citrus Aurantium, 15
Cladonia rangiferina, 140
Cladosporium epibryum, 206; Vincae, 161
Clark, E. D. & Kantor, J. L., Toxicological experiments with some of the higher fungi, 175
Classification of lichens, The nature and—I. Views and arguments of botanists concerning classification, 231
Clasterosporium **diffusum,** 21
Clavaria capitata, 217; farinosa, 209; granulosa, 209; militaris, 208, 209; parasitica, 218; radicosa, 218; sobolifera, 219
Claviceps, 37, 38, 44, 219; caricina, 223; cinereum, 221; microcephala, 221; nigricans, 38, 222; Paspali, 44, 222; purpurea, 220; Rolfsii, 44, 222; Tripsaci, 44, 223
Claviceps, A new host for, 37
Clematis Drummondii, 6
Clitocybe, 189, 190, 192, 193, 195; **Broadwayi,** 192; dealbata sudorifica, 293; geotropa, 41; illudens, 192; **incrustata,** 191; laccata, 190; **mexicana,** 191; monadelpha, 192; multiceps, 186; **niveicolor,** 190; pachylus, 192; proxima, 194; rivulosa, 192; **testaceoflava,** 191; **troyana,** 190
Clitopilus, 279; abortivus, 280
Coenogonium, 248
Coker, W. C. & Wilson, L., Schizosaccharomyces octosporus, 283

Colletotrichum, 205; **caulicolum,** 10; **griseum,** 11
Collybia, 167, 169; dryophila, 101; Shiitake, 42; stridula, 167
Collybidium dryophilum, 101; luxurians, 169
Colorado fungi, Studies in—I. Discomycetes, 57
Colorado, Notes on some species of Gymnosporangium in, 156
Conocybe tener, 100
Conotrema urceolatum, 248
Coprinus, 200, 202, 203; comatus, 78, 200–202; macrosporus, 167; sterquilinus, 166
Coprinus comatus, Note on the reputed poisonous properties of, 200
Cordyceps, 43, 207; acicularis, 208, 211, 225; agariciformia, 209, 217, 224; albella, 219; albida, 219; armeniaca, 208, 215, 225; caloceroides, 219; canadensis, 217; capitata, 217; carolinensis, 211; Cicadae, 219; clavulata, 208, 214, 224; Cockerellii, 209, 216, 225; entomorrhiza, 208, 212, 224; flavella, 208, 212; herculea, 208, 213, 224; insignis, 208, 211; isarioides, 209, 217, 225; Langloisii, 208, 215; Melolonthae, 211; Menesteridis, 212; militaris, 208, 209, 225; Miquelii, 219; nigriceps, 217; ophioglossoides, 218; palustris, 208, 210, 225; parasitica, 209, 218, 225; pistillariaeformis, 214; Ravenelii, 208, 210, 211, 225; sobolifera, 219, 225; sphecocephala, 208, 214, 225; sphecophila, 214; Sphingum, 209, 216, 225; stylophora, 208, 213, 225
Cornicularia, 106; divergens, 117; laeta, 143; lata, 143; ochroleuca nigricans, 137
Cortinarius, 24, 105
Cortinellus, 42; Shiitake, 42
Crataegus, 16, 160
Crepidotus lentinoides, 30
Cronartium Comptoniae, 67
Crouania asperella, 58, 59
Crucibulum crucibuliforme, 103; vulgare, 103
Cryptodiscus atro-cyaneus, 65
Cultures of some heteroecious rusts, 67
Cyathia hirsuta, 102
Cyathus striatus, 102
Cylindrosporium Celtidis, 12; **defoliatum,** 11; **griseum,** 12; **Lippiae,** 12; Negundinis, 8; **solitarium,** 13; **tenuisporum,** 13
Cynara Scolymus, 19
Cystococcus humicola, 108
Cystoderma, 81
Dactylium, 45
Danthonia spicata, 224
Dasyscypha allantospora, 63; arida, 62; **chlorella,** 63; fuscosanguinea, 62; viridula, 63
Dasyspora, 289; faveolata, 289
Dearness, J., The personal factor in mushroom poisoning, 75
Debaryomyces, 287
Dermatea inclusa, 65; macrospora, 65
Description of a new species and a variety, Morphology of the genus Cephalosporium, with, 170
Detonia trachycarpa, 59
Diaporthe parasitica, 291, 292
Dictyophora, 93
Dimerosporium **Parkinsoniae,** 5
Diospyros texana, 7
Diphysa, 288
Diplocladium, 45
Diplodia, 151–153; natalensis, 153
Diplodia of peach and orange, A gum-inducing, 151
Discomycetes, Studies in Colorado fungi—I, 57
Distichlis, 72, 73; spicata, 72, 74
Dothichloe, 223; Hypoxylon, 223

Eccilia, 271, 273; atrides, 273; **cubensis,** 273; **Earlei,** 274; **jamaicensis,** 274; rhodocylix, 273
Echinodontium tinctorium, 293
Elaeagnus, 16
Elaphomyces, 217, 218
Eleocharis, 38, 222, 289
Encalypta rhabdocarpa, 206
Entoloma, 24, 271, 278; **cinchonensis,** 279; lividum, 42; Murraii, 279
Ephelis, 223; borealis, 223; mexicana, 223
Epichloe Hypoxylon, 223
Epicoccum, 1, 3
Epidochium ambiens, 38
Eriophorum, 37
Eualectoria, 107
Euonymus japonicus, 11, 22
Eupatorium populifolium, 288; tubiflorum, 289
Euphorbia adenoptera, 289; lasiocarpa, 289
Evernia, 106, 115; Fremontii, 134; luteola, 142; ochroleuca cincinnati, 141; vulpina, 115
Exosporium **concentricum,** 22
Experiments with some of the higher fungi, Toxicological, 175

Fabronia andina, 206
Factor in mushroom poisoning, The personal, 75

Fawcett, H. S. & Burger, O. F., A gum-inducing Diplodia of peach and orange, 151
Ficus Carica, 16
Fifteenth parallel, American species of Alectoria occurring north of the, 106
Fimetaria, 162, 163
Fink, B., The nature and classification of lichens—I. Views and arguments of botanists concerning classification, 231
Flagellata, 246
Forsythia, 154; suspensa, 154, 155
Fraser, W. P., Cultures of some heteroecious rusts, 67
Fungi, Illustrations of—VIII, 97; IX, 165
Fungi, New species of Texas, 5
Fungi, Studies in Colorado—I. Discomycetes, 57
Fungi, Toxicological experiments with some of the higher, 175
Fusispora, 81

Galera tener, 100
Ganoderma oregonense, 293
Genus Cephalosporium, with description of a new species and a variety, Morphology of the, 170
Genus of myxomycetes, A new, 39
Gillenia stipulacea, 160
Godronia **Betheli,** 64
Gonatobotrys, 54
Gossypium herbaceum, 55
Gouania domingensis, 290
Grimmia Doniana, 206; ovata, 206
Groh, H., A new host for Claviceps, 37
Guatemala, The rusts of—II, 288
Gum-inducing Diplodia of peach and orange, A, 151
Gyalecta, 248
Gymnosporangium, 157, 160; durum, 156; exterum, 160; inconspicuum, 156, 158; juniperinum, 156; **Kernianum,** 157, 158; multiporum, 156, 158; Nelsoni, 157, 158; speciosum, 156, 157, 159, 160
Gymnosporangium in Colorado, Notes on some species of, 156
Gyromitra, 77; esculenta, 76

Hadrotrichum, 45
Harter, L. L., A new species of Alternaria, 154
Heald, F. D. & Wolf, F. A., New species of Texas fungi, 5
Hebeloma, 98, 166; **praecox,** 166
Hedera Helix, 22
Helminthosporium **giganteum,** 21
Helotium citrinum, 62; populinum, 62; sulphuratum, 62
Helvella crispa, 77; elastica, 58; esculenta, 77
Heteroecious rusts, Cultures of some, 67
Hiatula squamulosa, 86
Hicoria pecan, 21
Higher fungi, Toxicological experiments with some of the, 175
Hilaria, 221
Host for Claviceps, A new, 37
Howe, R. H., Jr., American species of Alectoria occurring north of the fifteenth parallel, 106
Humaria orthotricha, 59; rubens, 59
Hyalodidyma, 107
Hyalopus, 170–174; populi, 170
Hyalospora, 107
Hydrocybe, 189, 195, 279; **alboumbonata,** 195; **aurantia,** 195; **bella,** 196; **Cantharellus,** 196; coccineus, 198; **Earlei,** 196; **flavolutea,** 196; **hondurensis,** 197; **rosea,** 197; **subcaespitosa,** 197; **subflavida,** 197; **subminiata,** 198; **troyana,** 198
Hygrophorus, 24, 189, 195, 199, 204; bellus, 196; Cantharellus, 196; miniatus, 198; **montanus,** 199; **subpratensis,** 199; variolosus, 198
Hymenochaete Ellisii, 54
Hypholoma, 293
Hyphomycetes, Studies in North American—I, 45
Hypnum megaptilum, 206
Hypocreales of North America, Index to species in the, 225
Hypocreales of North America, The —IV, 207
Hypocrella Hypoxylon, 223
Hypoderma lineare, 65
Hyporhodius, 273
Hysterium, 244, 245; compressum, 66
Hysterographium Mori, 66; vulvatum, 66

Illustrations of fungi—VIII, 97; IX, 165
Index to species in the hypocreales of North America, 225
Inocybe, 24, 98, 178, 183–185, 187, 204; **abundans,** 104; **Astoriana,** 104; infelix, 104, 177, 187; infida, 97, 105, 178, 180, 184, 186, 187; **Lorillardiana,** 101
Isaria, 45, 208, 209; Cicadae, 219; farinosa, 209; Sphingum, 216
Ithyphallus, 93; impudicus, 291

Jatropha stimulosa, 9
Juglans nigra, 6; regia, 6
Juniperus, 160; monosperma, 160; utahensis, 157, 159, 160

Kantor, J. L., Clark, E. D. &, Toxicological experiments with some of the higher fungi, 175
Kentrosporium, 219; microcephalum, 221; militare, 209
Kern, F. D., The rusts of Guatemala —II, 288
Krieger, L. C. C., Note on the reputed poisonous properties of Coprinus comatus, 200
Kuehneola albida, 290

Laccaria, 189; laccata, 99, 190; ochropurpurea, 99
Lachnea miniata, 59; scutellata, 59; setosa, 59; umbrorum, 59
Lachnella canescens, 63; corticalis, 63; flammea, 63; resinarius, 63; rhoina, 63
Lachnellula chrysophthalma, 63, 64
Lachnum Engelmanni, 62; viridulum, 63
Lactaria, 24, 25, 168; camphoratus, 293; insulsa, 26; lignyotus, 293; subdulcis, 26, 168
Lagerstroemia indica, 18
Lasiobolus equinus, 61
Lecanora subfusca glabra, 248
Lecidea, 244, 245
Ledum, 67, 69, 70; groenlandicum, 69
Lentinula, 27, 28; cubensis, 28; **detonsa,** 28, 36
Lentinus, 27, 28; albellus, 31; annulatus, 27; blepharodes, 35; caelopus, 35; caespitosus, 192; calvescens, 30; castaneus, 35; chaetoloma, 36; chaetophorus, 29; chrysopeplus, 33; ciliatus, 34; crinitus, 31, 33, 36; cubensis, 28; detonsus, 28; echinopus, 35; estriatus, 30; exilis, 30; fallax, 35; fasciatus, 35; fastuosus, 35; Fockei, 29; fuligineus, 34; fumigatus, 32; furfurosus, 35; fuscopurpureus, 35; glabratus, 36; **graminicola,** 33; **hirtus,** 29, 31; holopogonius, 35; Hookerianus, 35; Kurzianus, 30; Lecomtei, 29; lepideus, 27; Leprieurii, 32; Leveillei, 32; melanophyllus, 30; nepalensis, 35; nicaraguensis, 32; nigripes, 31, 32; paraguayensis, 30; patulus, 29; praerigidus, 30; proximus, 28; pyramidatus, 31; rigidulus, 32; Rivae, 30; Schomburgkii, 32; scyphoides, 34; setiger, 35; similis, 35; siparius, 35; sparsibarbis, 29; striatulus, 29; strigellus, 33; strigosus, 29; stuppeus, 31, 32; subcervinus, 32; submembranaceus, 29; **subscyphoides,** 34; substrigosus, 29; suffrutescens, 27; Swartzii, 31; Tanghiniae, 29; tener, 31; Thwaitesii, 30; tubarius, 31; tuberregium, 28; vellereus, 30; velutinus, 34; verae-crucis, 25; villosus, 31, 32; Wrightii, 32; Zeyheri, 32; zonatus, 32, 35
Lentodium, 27; **squamosum,** 27, 31
Lepiota, 79–81, 88, 89, 194; **abruptibulba,** 88; americana, 87, 168; asprata, 85; **aspratella,** 84; **Broadwayi,** 84; carminea, 88; cepaestipes, 86; **colimensis,** 82; **cretacea,** 86, 87; cristata, 85; erythrella, 88; farinosa, 86; **flavodisca,** 82; floralis, 85; fulvaster, 84; hemisclerus, 87; ianthina, 82; **jamaicensis,** 87; **lactea,** 81; longistriata, 85; Magnusiana, 86; mammaeformis, 86; Morgani, 168; naucinoides, 76; ochrospora, 89, 90; procera, 81; purpureoconia, 88; **rimosa,** 85; rubrotincta, 83, 88; subclypeolaria, 87; **subcristata,** 83; **subgranulosa,** 83; **subgrisea,** 84; **tepeitensis,** 82; **testacea,** 83
Leptonia, 271; miniata, 272
Leptoniella, 271; **atrosquamosa,** 272; **cinchonensis,** 273; **Earlei,** 272; **hypoporphyra,** 272; **mexicana,** 273; **miniata,** 272; serrulata, 272
Leptonium, 271
Leucomyces, 79, 80; **mexicanus,** 80
Lichen, 106; bicolor, 123; chalybeiformis, 119; jubatus, 127, 150; ochroleucos, 139; sarmentosus, 144, 150
Lichens, The nature and classification of—I. Views and arguments of botanists concerning classification, 231
Ligustrum californicum, 14
Limacella, 79, 81; **agricola,** 81; illinita, 81
Lippia ligustrina, 12; myriocephala, 289
Lobaria, 106
Locellina hiatuloides, 280
Lophodermium arundinaceum, 66
Loranthus, 290
Lycoperdon atropurpureum, 293
Lymacium, 199

Macbride, T. H., A new genus of myxomycetes, 39

Malachra capitata, 19
Malvaviscus, 290
Marasmius, 42, 192; Emerici, 25; obliquus, 25; Sacchari, 291
Mastocephalus, 81; carneo-annulatus, 88
Melampsoropsis abietina, 67, 69; Cassandrae, 67–69; ledicola, 67, 69, 70; Pyrolae, 67, 70
Melanconis modonia, 292; perniciosa, 292
Melanoleuca, 189, 193, 194; **dichropus,** 193; **holoporphyra,** 193; **jalapensis,** 194; **jamaicensis,** 194; melaleuca, 167; **subisabellina,** 194
Microstroma, 45
Mimosa albida floribunda, 288
Mitrula gracilis, 57; irregularis, 58; musicola, 57, 58
Mollisia cinerea, 64; lanaria, 161
Momordica balsamina, 22
Monadelphus, 189, 192; **caespitosus,** 192, 193; illudens, 193
Morchella esculenta, 101
Morphology of the genus Cephalosporium, with description of a new species and a variety, 170
Mucidula, 91
Murrill, W. A., Illustrations of fungi —VIII, 97; IX, 165; The Agaricaceae of tropical North America—I, 23; II, 79; III, 189; IV, 271
Mushroom poisoning, The personal factor in, 75
Mycogone, 45
Myrica, 67
Myxomycetes, A new genus of, 39
Myxotrichum, 45

Nature and classification of lichens, The—I. Views and arguments of botanists concerning classification, 231
Naucoria pennsylvanica, 102; semiorbicularis, 98
Nectria, 43
Neurophyllum ochraceum, 24; viride, 25
New genus of myxomycetes, A, 39
New host for Claviceps, A, 37
New species and a variety. Morphology of the genus Cephalosporium, with description of a, 170
New species of Alternaria, A, 154
New species of Texas fungi, 5
New species of Thyrococcum, A, 1
News and notes, 41, 92, 161, 203, 291
Nolanea, 271, 272, 274; Babingtonii, 274; **cubensis,** 275; helicta, 274; **jamaicensis,** 275
North America, Index to species in the hypocreales of, 225
North America, The Agaricaceae of tropical—I, 23; II, 79; III, 189; IV, 271
North America, The hypocreales of—IV, 207
North American hyphomycetes, Studies in—I, 45
North of the fifteenth parallel, American species of Alectoria occurring, 106
Note on the reputed poisonous properties of Coprinus comatus, 200
Notes, News and, 41, 92, 161, 203, 291
Notes on some species of Gymnosporangium in Colorado, 156
Nothofagus antarctica, 92

Ocellaria aurea, 65; **ocellata,** 65
Oedocephalum, 45
Oidium, 45
Olpitrichum, 53, 54; carpophilum, 54–56; **macrosporum,** 55, 56
Omphalia, 192, 193, 196, 197; Gerardiana, 99; montana, 99; **Volkertii,** 98
Opegrapha, 244, 245
Ophiobolus Gnaphalii, 161; Gnaphalii lanaria, 161; vulgaris, 161
Ophiodothis, 223
Ophionectria Cockerellii, 216
Orange, A gum-inducing Diplodia of peach and, 151
Orbilia flexuosa, 64; vinosa, 64
Oropogon, 107; Loxensis, 149
Otidea leporina, 59
Ozonium, 203

Panaeolus, 100, 201, 202; campanulatus, 201, 202; retirugis, 100
Panicum barbinode, 289
Panus, 28; cubensis, 30; guaraniticus, 33; hirtus, 29; Infundibulum, 30; rudis, 29; stypticus, 105; velutinus, 34; velutipes, 33; Wrightii, 25
Parallel, American species of Alectoria occurring north of the fifteenth, 106
Parkinsonia aculeata, 5
Parmelia, 106; crinita pilosella, 248; rudecta, 248; *saxatilis, 248; saxatilis furfuracea, 248
Paspalum, 44, 222
Patellaria, 244, 245; atrata, 64
Paxillus, 24
Peach and orange, A gum-inducing Diplodia of, 151
Penicillium, 2, 45, 172
Peraphyllum, 158

Peridermium, 67, 70–72; abietinum, 67, 69; balsameum, 67, 72; columnare, 67; conorum-Piceae, 67, 70, 71; consimile, 67–69; decolorans, 67, 70; elatinum, 67; Harknessii, 160; Peckii, 67
Peronospora, 251
Personal factor in mushroom poisoning, The, 75
Pertusaria velata, 248
Peziza arida, 62; badia, 60; brunneoatra, 60; cupularis, 59; flammea, 63; modesta, 58, 59; ocellata, 65
Phaeospora, 107
Phallus Ravenelii, 93
Phaseolus atropurpurea, 289; vulgaris, 10
Phialea phaeconia, 161
Philadelphus, 159, 160; microphyllus, 160; occidentalis, 159, 160
Phleospora **adusta,** 6; **multimaculans,** 6
Pholiota candicans, 165; Glaziovii, 89, 90; praecox, 165
Phoma cercidicola, 161; Halesiae, 161; regina, 161
Phyllosticta **biformis,** 7; **bumeliifolia,** 7; **congesta,** 8; **Verbesinae,** 8
Physospora, 46; elegans, 54; rubiginosa, 47
Phytophthora infestans, 204
Picea, 67–70; canadensis, 69–71; mariana, 69–71; rubra, 68–71
Pinus, 65; contorta, 111, 112
Placodium elegans, 248
Platanus occidentalis, 6
Pleuropus, 271, 279; **abortivus,** 280; **Earlei,** 280
Pleurotus caespitosus, 192; russaticeps, 42
Plicatura guadelupensis, 24, 25; lateritia, 24; **obliqua,** 25
Pluteus, 271, 275, 279; aethalus, 278; alborubellus, 277; cervinus, 275, 276; **Earlei,** 276; **Harrisii,** 277; **jamaicensis,** 278; laetifrons, 277, 278; leoninus, 278; **multistriatus,** 277; nitens, 276; **reticulatus,** 276; **rimosus,** 276; tephrostictus, 278
Pocillaria, 28; cinnamomea, 35; Palmeri, 33; reflexa, 36; simulans, 33; vestida, 32
Poisoning, The personal factor in mushroom, 75
Poisonous properties of Coprinus comatus, Note on the reputed, 200
Polygonum, 289
Polymyces, 79, 90, 91; cinereus, 90
Polyporus recurvatus, 205; squamosus, 41
Polythrincium, 45
Populus tremuloides, 62, 64, 65
Poria bicolor, 205
Pragmopara, 244, 245
Properties of Coprinus comatus, Note on the reputed poisonous, 200
Propolis faginea, 65; versicolor, 65
Prosopis glandulosa, 20
Prunus, 8
Psathyra, 293
Pseudopeziza Medicaginis, 64
Psilocybe Foenisecii, 99
Psilopezia Babingtoni, 58
Puccinia, 289; Eleocharidis, 289; Gouaniae, 290; gregaria, 288; inanipes, 289; Lippiae, 289; Polygoni-amphibii, 289; subnitens, 74
Pucciniastrum arcticum, 67, 72; minimum, 67, 72; Myrtilli, 67; pustulatum, 67, 72; Pyrolae, 67
Punica Granatum, 18
Pyrola, 67, 71; americana, 71; elliptica, 71
Pyropolyporus Calkinsii, 205; igniarius, 205

Quercus nigra, 205

Ramalina calicaris, 110, 111; gracilis, 113
Ramaria farinosa, 209
Ramularia **hedericola,** 21; **Momordicae,** 22
Ravenelia Mimosae-albidae, 288
Reputed poisonous properties of Coprinus comatus, Note on the, 200
Rhinotrichum, 46, 47, 53–55; armeniacum, 47, 49, 56; bellum, 52; **bicolor,** 47, 50, 56; breve, 53; canescens, 46; carneum, 47, 49, 56; corticioides, 54; cucumerinum, 54; Curtisii, 46–49, 52, 56; doliolum, 53; fulvum, 47, 48, 56; fusiferum, 53; herbicolum, 52; **laevisporum,** 47, 49, 56; macrosporum, 54, 55; muricatum, 54; pulveraceum, 52; ramosissimum, 46, 47, 51, 56; ramosissimum marginatum, 52; repens, 47, 50, 56; **rubiginosum,** 47, 56; simplex, 46; subalutaceum, 47, 49, 50, 56; **subferruginosum,** 47, 56; sulfureum, 47, 50, 56; Sumstinei, 48, 56; tenellum, 54; **tenerum,** 47, 51, 56; Thwaitesii fulvum, 48
Rhododendron, 67
Rhodophyllus, 278
Rhodosporus, 279
Rhytisma lineare, 65
Robinia pseudacacia, 13
Rocella, 244, 245

Roestelia, 156, 159, 160; fimbriatum, 156; Harknessianoides, 156
Rosellinia, 163
Rubus, 67; glaucus, 289; idaeus aculeatissimus, 72; poliophyllus, 289
Rulac texana, 8
Russula, 24, 25, 41, 291; **mexicana,** 26; palustris, 26
Russuliopsis, 189
Rusts, Cultures of some heteroecious, 67
Rusts of Guatemala, The—II, 288
Ryparobius crustaceus, 61; pachyascus, 61; sexdecimsporus, 61

Saccharomyces Ludwigii, 287
Saccharum officinarum, 170
Saccobolus Kerverni, 61; neglectus, 61
Salicornia, 73, 74; europea, 73
Sapindus marginatus, 12
Sarcosphaera arenosa, 60
Schenella, 39; **simplex,** 39
Schizophyllum commune, 291
Schizosaccharomyces, 283, 287; asporus, 283; mellacei, 283; octosporus, 283–287; Pombe, 283; 286
Schulzeria Eyrei, 89
Scirpus, 37, 38
Scleroderma, 217; Geaster, 41
Sclerotium Clavus, 219, 220; Paspali, 44, 222; sulcatum, 38, 223
Seaver, F. J., Index to species in the hypocreales of North America, 225; Studies in Colorado fungi—I. Discomycetes, 57; The hypocreales of North America—IV, 207
Sepedonium, 45
Septoria **Jatrophae,** 9; lanaria, 161; **marginata,** 8; **pertusa,** 9
Setaria, 106; trichodes, 131
Solidago canadensis, 52
Some heteroecious rusts, Cultures of, 67
Some of the higher fungi, Toxicological experiments with, 175
Some species of Gymnosporangium in Colorado, Notes on, 156
Sorbus, 160
Sordaria, 162, 163
Sorghum halapense, 9
Sorosporium Reilianum, 164
Species and a variety, Morphology of the genus Cephalosporium, with description of a new, 170
Species in the hypocreales of North America, Index to, 225
Species of Alectoria occurring north of the fifteenth parallel, American, 106
Species of Alternaria, A new, 154
Species of Gymnosporangium in Colorado, Notes on some, 156
Species of Texas fungi, New, 5
Species of Thyrococcum, A new, 1
Spermoedia, 207, 219, 224; cinerea, 220, 221; Clavus, 220; microcephala, 220, 221; nigricans, 220, 222; Paspali, 222; **Rolfsii,** 220, 222; **Stevensii,** 220, 222; **Tripsaci,** 220, 223
Sphacelia, 219; Segetum, 220
Sphacelotheca, 164
Sphaeria, 207; agariciformia, 217; entomorrhiza, 212; herculea, 213; microcephala, 221; ophioglossoides, 218; purpurea, 220; radicosa, 218; sobolifera, 219; Sordaria, 163; sphecocephala, 214
Sphaeropsis tumefaciens, 204
Sphaerospora trechispora, 60
Spirogyra, 284
Sporotrichum, 47; rubiginosum, 46, 47
Stagonospora **gigantea,** 9; macrospora, 10
Stemonitis, 39
Stereocaulon, 107
Stereum purpureum, 292
Stictis radiata, 65
Stilbum, 244, 245
Studies in Colorado fungi—I. Discomycetes, 57
Studies in North American hyphomycetes—I, 45
Suedia maritima, 73
Sumstine, D. R., Studies in North American hyphomycetes—I, 45
Syringa, 18

Taphrina entomospora, 92
Texas fungi, New species of, 5
Theloschistes parietius, 248
Thyrococcum, 3; **humicola,** 3
Thyrococcum, A new species of, 1
Torrubia, 207; capitata, 217; carolinensis, 211; clavulata, 214; entomorrhiza, 212; Melolonthae, 211; militaris, 209; Miquelii, 219; ophioglossoides, 218; pistillariaeformis, 214; Ravenelii, 211; sobolifera, 219; sphecocephala, 214; Sphingum, 216; superficialis, 211
Toxicological experiments with some of the higher fungi, 175
Trametes suaveolens, 80
Tricholoma, 24, 167, 193, 279; alboflavidum, 192; melaleucum, 167; melaleucum thujinum, 167; microcephalum, 167; subcinereum, 168
Tripsacum dactyloides, 44, 220, 223
Trogia cinerea, 24

Tropical North America, The Agaricaceae of—I, 23; II, 79; III, 189; IV, 271
Ulmus crassifolia, 14
Ulota phyllantha, 206
Uncinula magellanica, 92; Nothofagi, 92
Uredo Gouaniae, 290; malvicola, 290
Uromyces, 72, 290; appendiculatus, 289; **Gouaniae,** 290; leptodermis, 289; Peckianus, 72, 74; proēminens, 289; Rubi, 289, 290
Usnea, 106, 115, 128, 129, 244, 245; angulata, 129; barbata, 128, 129, 140; cavernosa, 135; florida, 121; implexa, 131; jubata, 150; jubata nigricans, 127; rigida horsum, 119; trichodea, 115
Ustilaginoidea, 224; Oryzae, 224
Ustilago, 164

Vaccinium, 67, 72
Vaginata, 79, 80; **vaginata,** 80
Variety, Morphology of the genus Cephalosporium, with description of a new species and a, 170
Venenarius, 79, 80
Verbesina texana, 8, 17
Verticillium, 45
Views and arguments of botanists concerning classification. The nature and classification of lichens—I, 231
Volutella Vincae, 161
Volvaria, 280; bombycina, 281; volvacea, 280
Volvariopsis, 271, 280; **Bakeri,** 281; **bombycina,** 280, 281; **cubensis,** 281; **Earlei,** 282; **jamaicensis,** 281
Volvarius, 280

Willia Saturnus, 287
Wilson, L., Coker, W. C. &, Schizosaccharomyces octosporus, 283
Wolf, F. A., Heald, F. D. &, New species of Texas fungi, 5

Xanthium, 21
Xerotinus martinicensis, 24; Mauryi, 24
Xerotus caribaeus, 24; guadelupensis, 25; Mauryi, 25; rawakensis, 25; reniformis, 32; tomentosus, 32
Xylaria gracilis, 212
Xylopia, 288

Yucca rupicola, 17

Zinnia, 14
Zygodesmus, 45, 54; laevisporus, 49
Zygosaccharomyces, 287

JOURNAL OF MYCOLOGY AND REPRINTS

Journal of Mycology, Vols. 8–13, per volume $3.00
Index to North American Mycology, 1900–1908, 13 parts issued, per part ..... .25
Index to Uredineous Infection Experiments ..... .50
Portraits of Eminent Mycologists, each ..... .10
New Genera of Fungi published since 1900; original descriptions with full citation ..... .75
First and Second Supplements to New Genera of Fungi, each .50
Index to Journal of Mycology, Vols. 1–10 ..... .75
Mycological Glossary ..... .25
North American Species of Marasmius, Lepiota, Agaricaceae, by A. P. Morgan, each ..... .50
Cortinarius; Key to Species, by C. H. Kauffman ..... .25
Saccardo's Arrangement and Nomenclature of Fungi (Orders and Families) ..... .15

Address MISS MAUDE KELLERMAN,
175 West Eleventh Ave., Columbus, Ohio.

CONTRIBUTIONS FROM THE NEW YORK BOTANICAL GARDEN

Price, 25 cents each. See next page for recent numbers.

No. 17. The Tylostomaceae of North America, by V. S. White.
No. 24. The Nidulariaceae of North America, by V. S. White.
No. 27. Some Mt. Desert Fungi, by V. S. White.
Nos. 29, 32, 35, 38, 41, 49, 52, 56, 60, 69, 70 and 74. The Polyporaceae of North America, I–XIII, by W. A. Murrill.
No. 90. Studies in North American Peronosporales—I. The Genus Albugo, by Guy West Wilson.
No. 95. Studies in North American Peronosporales—II. Phytophthoreae and Rhysotheceae, by Guy West Wilson.
No. 99. Some Philippine Polyporaceae, by W. A. Murrill.
No. 110. Additional Philippine Polyporaceae, by W. A. Murrill.
No. 111. Boleti from Western North Carolina, by W. A. Murrill.
No. 114. The Boleti of the Frost Herbarium, by W. A. Murrill.
No. 115. Some North Dakota Hypocreales, by F. J. Seaver.
No. 117. Studies in North American Peronosporales—IV. Host Index, by G. W. Wilson.
No. 119. North Dakota Slime-Moulds, by F. J. Seaver.
No. 122. Notes on North American Hypocreales—II. Nectria Peziza, by F. J. Seaver.

Address NEW YORK BOTANICAL GARDEN,
Bronx Park, New York City.

PUBLICATIONS
OF
The New York Botanical Garden

Journal of the New York Botanical Garden, monthly, illustrated, containing notes, news and non-technical articles of general interest. Free to all members of the Garden. To others, 10 cents a copy; $1.00 a year. [Not offered in exchange.] Now in its twelfth volume.

Mycologia, bimonthly, illustrated in color and otherwise; devoted to fungi, including lichens; containing technical articles and news and notes of general interest. $3.00 a year; single copies not for sale. [Not offered in exchange.] Now in its third volume.

Bulletin of the New York Botanical Garden, containing the annual reports of the Director-in-Chief and other official documents, and technical articles embodying results of investigations carried out in the Garden. Free to all members of the Garden; to others, $3.00 per volume. Seven volumes.

North American Flora. Descriptions of the wild plants of North America, including Greenland, the West Indies and Central America. Planned to be completed in thirty volumes. Roy. 8vo. Each volume to consist of four or more parts. Subscription price, $1.50 per part; a limited number of separate parts will be sold for $2.00 each. [Not offered in exchange.]

Vol. 22, part 1, issued May 22, 1905. Rosales, Podostemonaceae, Crassulaceae, Penthoraceae, Parnassiaceae.

Vol. 22, part 2, issued December 18, 1905. Saxifragaceae, Hydrangeaceae, Cunoniaceae, Iteaceae, Hamamelidaceae, Pterostemonaceae, Altingiaceae, Phyllonomaceae.

Vol 7, part 1, issued Oct. 4, 1906. Ustilaginaceæ, Tilletiaceae.

Vol. 7, part 2, issued March 6, 1907. Coleosporiaceae, Uredinaceae, Aecidiaceae (pars).

Vol. 25, part 1, issued August 24, 1907. Geraniaceae, Oxalidaceae, Linaceae, Erythroxylaceae.

Vol. 9, parts 1 and 2, issued December 19, 1907, and March 12, 1908. Polyporaceae. (Part 1 no longer sold separately.)

Vol. 22, part 3, issued June 12, 1908. Grossulariaceae, Platanaceae, Crossosomataceae, Connaraceae, Calycanthaceae, Rosaceae (pars).

Vol. 22, part 4, issued Nov. 20, 1908. Rosaceae (pars).

Vol. 17, part 1, issued June 30, 1909. Typhales—Poales.

Vol. 16, part 1, issued Nov. 6, 1909. Ophioglossales—Filicales.

Vol. 9, part 3, issued Feb. 3, 1910. Boletaceae, Chanterelleae, and Lactarieae (pars).

Vol. 25, part 2, issued June 3, 1910. Tropaeolaceae—Malpighiaceae.

Vol. 3, part 1, issued Dec. 29, 1910. Nectriaceae, Hypocreaceae, Chaetomiaceae, Fimetariaceae.

Vol. 25, part 3, issued May 6, 1911. Rutaceae—Burseraceae.

Memoirs of the New York Botanical Garden. Price to members of the Garden, $1.00 per volume. To others, $2.00. [Not offered in exchange.]

Vol. I. An Annotated Catalogue of the Flora of Montana and the Yellowstone Park, by Dr. Per Axel Rydberg. ix+492 pp., with detailed map. 1900.

Vol. II. The influence of Light and Darkness upon Growth and Development, by Dr. D. T. MacDougal. xvi+320 pp., with 176 figures. 1903.

Vol. III. Studies of Cretaceous Coniferous Remains from Kreischerville, New York, by Dr. Arthur Hollick and Dr. Edward Charles Jeffrey. viii—138 pp., with 29 plates. 1909.

Vol. IV. Effects of the Rays of Radium on Plants, by Charles Stuart Gager. viii+278 pp., with 73 figures and 14 plates. 1908.

Contributions from the New York Botanical Garden. A series of technical papers written by students or members of the staff, and reprinted from journals other than the above. Price, 25 cents each. $5.00 per volume. Now in the sixth volume.

RECENT NUMBERS 25 CENTS EACH.

142. Notes on Rosaceae—V, by P. A. Rydberg.

143. Results of a Preliminary Study of the So-called Kenai Flora of Alaska, by Arthur Hollick.

144. The Paleobotanical Collections of the New York Botanical Garden, by Arthur Hollick.

145. Notes on Rosaceae—VI, by P. A. Rydberg.

NEW YORK BOTANICAL GARDEN
BRONX PARK, NEW YORK CITY